Software Product Description

PRODUCT NAME: DECrouter 250, Version 1.1 **SPD 32.15.02**

DESCRIPTION

The DECrouter 250 software is a communications product that provides an asynchronous/synchronous routing service for the Local Area Network (LAN). This allows DECnet nodes running DDCMP to communicate with nodes on an Ethernet/802.3 LAN and allows DECnet DDCMP nodes on an Ethernet/802.3 LAN to communicate with nodes outside the LAN within a Wide Area Network (WAN).

Overview

The DECrouter 250 software provides access to and from Phase IV/IV+ DECnet nodes on a LAN and Phase III or Phase IV/IV+ DECnet nodes over asynchronous/synchronous lines. These nodes can be located either locally via dedicated wiring, or remotely via modem connections. Note that LAN refers to any Local Area Network that conforms to IEEE 802.3, or ISO 8802/3 standards.

The DECrouter 250 software runs on the DECrouter 250 (DSRVR) and the DEC WANserver 150 (DSRVJ) hardware units. These contain an Ethernet interface port (IEEE 802.3 compatible). The DECrouter 250 hardware has eight asynchronous/synchronous serial communications ports, and the DEC WANserver 150 has two asynchronous/synchronous serial communications ports.

The DECrouter 250 software performs adaptive routing utilizing all of the asynchronous/synchronous lines and the Ethernet/802.3 ports of the hardware. In the case where communications to an end node might pass through multiple routers, the DECrouter 250 software has the capability of choosing the least cost path or rerouting in case of a line failure.

The DECrouter 250 software supports intra-area (Level 1) and inter-area (Level 2) routing of messages between DECnet nodes. These nodes can be Phase III/IV/IV+ routing nodes or end nodes. Use of this software offloads routing-related communications from hosts that would otherwise serve as routing nodes on the Local Area Network-based DECnet LAN.

A major security feature of the DECrouter 250 software is support for modem dial-back. This feature allows network managers tighter control over access to their DECnet networks.

The DECrouter 250 software must be downline loaded onto the DECrouter 250 or DEC WANserver 150 hardware units over the Ethernet/802.3 port or the serial communications ports.

Routing and DECnet Phase IV Areas

The DECrouter 250 software implements Phase IV/IV+ DECnet DDCMP routing and network management. Phase IV/IV+ DECnet networks are hierarchical networks that can be segmented into up to 63 areas, each containing up to 1023 nodes.

Routers can be one of two types; Level 1 or Level 2. Level 1 Routers route directly toward nodes within their own area, and route toward a Level 2 Router when the destination node is in a different area. Level 2 Routers act as Level 1 Routers within their own area, but in addition, route to other areas.

The DECrouter 250 software supports both the intra-area routing (Level 1) and inter-area routing (Level 2) for Phase IV/IV+ nodes on a Local Area Network, or Phase III/IV/IV+ remote nodes connected to one of the asynchronous/synchronous serial communications ports.

Line Support

The DECrouter 250 software uses the DECrouter 250 or DEC WANserver 150 hardware serial communications ports to connect nodes running asynchronous or synchronous DDCMP DECnet, and the Ethernet/802.3 ports to connect to the Ethernet/802.3 LAN. The asynchronous/synchronous ports operate in full-duplex, point-to-point mode and support the ability to connect manually dialed or auto-answered modems. The asynchronous/synchronous ports have been designed to be compatible with modems conforming to Bell standards and CCITT recommendations. Note that multipoint lines or connections to DMC11s are not supported.

Refer to the System Support Addendum (SSA 32.15.02-x) for further information on supported modems.

The DECrouter 250 (DSRVR) hardware has two high speed serial ports and six low speed serial ports. The DEC WANserver 150 hardware has one high speed serial port and one low speed serial port. The low speed ports operate at up to 19.2 Kbps, and conform to CCITT V.28/V.24 (EIA-232-D). The high speed ports operate at speeds up to 64 Kbps and support CCITT V.36/V.11 (EIA-449/422), CCITT V.10 (EIA-449/423), CCITT V.35 Appendix A, as well as CCITT V.28/V.24 (EIA-232-D). In asynchronous mode all ports operate at 19.2 Kbps maximum.

The DECrouter 250 software with the DECrouter 250 hardware supports eight lines at speeds and configurations of 2x64 Kbps, or 1x64 Kbps and 4x9.6 Kbps, or 8x19.2 Kbps.

The DECrouter 250 software with the DEC WANserver 150 hardware unit supports two lines at speeds and configurations of 1x64 Kbps and 1x9.6 Kbps, or 2x19.2 Kbps.

Adapter cables provide the necessary interchange circuits for the high speed ports. Refer to the System Support Addendum (SSA 32.15.02-x) for further information on the required adapter cables.

Installation and Configuration

The DECrouter 250 software is installed and configured on a VMS, ULTRIX (VAX or RISC), or MS-DOS®/PC-DOS system (termed a load host).

The appropriate DECrouter system image is downline loaded from the load host into the memory of the DECrouter 250 or DEC WANserver 150 hardware units. This system image can be downline loaded over the serial communications ports, as well as the Ethernet/802.3 ports. It should be noted, however, that some load hosts will not support downline loading over serial communications ports.

To identify which devices on a load host will provide support for serial-line loading, refer to the corresponding DECnet Software Product Description for that host. (DECnet-VAX SPD 25.03.xx and DECnet-ULTRIX SPD 26.83.xx.)

Each DECrouter 250 and DEC WANserver 150 hardware unit will have a separate system image on a load host.

The DECrouter 250 software contains the configuration information that tailors the dedicated router system for proper operation in its intended environment.

The configuration information contained in the system image on the load host can be modified by the System/Network Manager using a utility provided on the installation kit. The changes made to the configuration information in the system image are retained until the configuration utility is used to modify those changes. The changes take effect the next time the system image is downline loaded to the DECrouter 250 or DEC WANserver 150 hardware.

Network and Configuration Management

The Network Management Utility (DECnet Network Control Program (NCP)) on Phase IV DECnet hosts can execute commands remotely with the DECrouter 250 software to perform three primary functions:

- Display statistical and error information for the router (for example, statistics on line usage or errors)
- Control the operation of the router (for example, starting and stopping lines, setting parameters, and loading software)
- Test the components of the network (for example, loop messages through all or part of a communications path to isolate a defective component)

The DECrouter 250 software also has a monitor that is available both locally and remotely. The remote monitor runs on VMS, ULTRIX (VAX or RISC), and MS-DOS/PC-DOS host systems to monitor the current state of the router. These displays are updated at pre-set intervals and present current router data and status information such as CPU and line utilizations, current adjacencies, and buffer use.

Path Splitting

If the costs are set appropriately, the DECrouter 250 software performs path splitting. Note that routing cost is an arbitrary network management parameter set by the network manager to control network traffic flow. If the cost between the router and the destination node is the same on multiple asynchronous/synchronous ports, up to a maximum of four circuits, then the DECrouter 250 software splits traffic across the ports. As a result, higher data transfer rates and higher reliability due to redundant paths are provided.

It should be noted that for this path splitting feature to work, the destination nodes must support out-of-order packet caching.

Performance

The DECrouter 250 software will support and saturate the following serial line speeds and configurations with minimum size DECnet packets:

- On DECrouter 250 hardware: 2x64 Kbps, or 1x64 Kbps and 4x9.6 Kbps, or 8x19.2 Kbps
- On DEC WANserver 150 hardware: 1x64 Kbps and 1x9.6 Kbps, or 2x19.2 Kbps.

HARDWARE REQUIREMENTS

VAX, MicroVAX, VAXstation, VAXserver, DECstation, DECsystem, or PC configuration as specified in the System Support Addendum (SSA 32.15.02-x).

DSRVR or DSRVJ as specified in the System Support Addendum (SSA 32.15.02-x).

SOFTWARE REQUIREMENTS

For each VMS system acting as a load host or dump receiver:

VMS Operating System running DECnet-VAX (either end-node or full function)

For each ULTRIX system acting as a load host or dump receiver:

ULTRIX Operating System running DECnet-ULTRIX

For each PC System acting as a load host or dump receiver:

MS-DOS Operating System or PC-DOS Operating System running DECnet-DOS.

Refer to the System Support Addendum (SSA 32.15.02-x) for availability and required versions of prerequisite/optional software.

ORDERING INFORMATION

For VMS Operating Systems:

Software Licenses: QL-YG6A9-**
Software Media: QA-YG6AA-**
Software Documentation: QA-YG6AA-GZ
Software Product Services: QT-YG6*-**

For ULTRIX Operating Systems on VAX:

Software Licenses: QL-YG6A9-**
Software Media: QA-YG6AB-**
Software Documentation: QA-YG6AB-GZ
Software Product Services: QT-YG6*-**

For ULTRIX Operating Systems on RISC:

Software Licenses: QL-YG6A9-**
Software Media: QA-YG6AD-**
Software Documentation: QA-YG6AD-GZ
Software Product Services: QT-YG6*-**

For MS-DOS Operating Systems or PC-DOS Operating Systems:

Software Licenses: QL-YG6A9-**
Software Media: QA-YG6AC-**
Software Documentation: QA-YG6AC-GZ
Software Product Services: QT-YG6*-**

* Denotes variant fields. For additional information on available licenses, services, and media, refer to the appropriate price book.

SOFTWARE LICENSING

A separate license is needed for each DECrouter 250 (DSRVR) hardware and DEC WANserver 150 (DSRVJ) hardware units on which this software product will be used (except as otherwise specified by Digital).

The licensing provisions of Digital Equipment Corporation's Standard Terms and Conditions provide in part that the software and any part thereof (but excluding those parts specific to the load hosts) may be used only on the single DECrouter 250 (DSRVR) hardware or DEC WANserver 150 hardware unit on which the software is operated, but may be copied, in whole or in part (with the proper inclusion of Digital's copyright notice and any proprietary notices on the software) between multiple load hosts on the same LAN.

This product does not provide support for the VMS or ULTRIX License Management Facility. A Product Authorization Key (PAK) is not required for installation or use of this version of the product.

This software is furnished under the licensing provisions of Digital Equipment Corporation's Standard Terms and Conditions. For more information about Digital's licensing terms and policies, contact your local Digital office.

SOFTWARE PRODUCT SERVICES

A variety of service options are available. For more information, please contact your local Digital office.

SOFTWARE WARRANTY

The DECrouter 250 software is warranted for use only with supported Phase III/IV/IV+ DECnet products supplied by Digital.

Warranty for this software product is provided by Digital with the purchase of a license for the product as defined in the Software Warranty Addendum of this SPD.

® Hayes is a registered trademark of Hayes Microcomputer Products, Inc.

® IBM is a registered trademark of International Business Machines Corporation.

® COMPAQ and Deskpro are registered trademarks of COMPAQ Computer Corporation.

® Olivetti is a registered trademark of Ing. C. Olivetti.

® Tandy is a registered trademark of Tandy Corporation.

® Toshiba is a registered trademark of Kabushiki Kaisha Toshiba.

® MS-DOS is a registered trademark of Microsoft Corporation.

™ SmartModem 2400 is a trademark of Hayes Microcomputer Products, Inc.

™ The DIGITAL Logo, CI, DEC, DECnet, DECrouter, DECstation, DECsystem, MicroVAX, MicroVMS, PATHWORKS, ThinWire, ULTRIX, VAX, VAXcluster, VAXft, VAXmate, VAXserver, VAXstation, and VMS are trademarks of Digital Equipment Corporation.

System Support Addendum

PRODUCT NAME: DECrouter 250, Version 1.1 **SSA 32.15.02-A**

HARDWARE REQUIREMENTS

Processors Supported

VAX: VAXft 3000-310

VAX 4000 Model 200,
VAX 4000 Model 300

VAX 6000 Model 200 Series,
VAX 6000 Model 300 Series,
VAX 6000 Model 400 Series,
VAX 6000 Model 500 Series

VAX 8200, VAX 8250, VAX 8300, VAX 8350,
VAX 8500, VAX 8530, VAX 8550, VAX 8600,
VAX 8650, VAX 8700, VAX 8800, VAX 8810,
VAX 8820, VAX 8830, VAX 8840

VAX 9000-210, VAX 9000 Model 400 Series

VAX-11/730, VAX-11/750, VAX-11/780,
VAX-11/785

MicroVAX: MicroVAX II, MicroVAX 2000,
MicroVAX 3100, MicroVAX 3300,
MicroVAX 3400, MicroVAX 3500,
MicroVAX 3600, MicroVAX 3800,
MicroVAX 3900

VAXstation: VAXstation II, VAXstation 2000,
VAXstation 3100 Series, VAXstation 3200,
VAXstation 3500, VAXstation 3520,
VAXstation 3540

VAXserver: VAXserver 3100, VAXserver 3300,
VAXserver 3400, VAXserver 3500,
VAXserver 3600, VAXserver 3602,
VAXserver 3800, VAXserver 3900

VAXserver 4000 Model 300

VAXserver 6000-210, VAXserver 6000-220,
VAXserver 6000-310, VAXserver 6000-320,
VAXserver 6000-410, VAXserver 6000-420,
VAXserver 6000-510, VAXserver 6000-520

For ULTRIX Load Host Systems:

VAX-Based Processors:

VAX: VAX 6000-210, VAX 6000-220,
VAX 6000-230, VAX 6000-240,
VAX 6000 Model 300 Series,
VAX 6000 Model 400 Series,
VAX 6000 Model 500 Series

VAX 8200, VAX 8250, VAX 8300, VAX 8350,
VAX 8500, VAX 8530, VAX 8550, VAX 8600,
VAX 8650, VAX 8700, VAX 8800, VAX 8810,
VAX 8820, VAX 8830, VAX 8840

VAX-11/750, VAX-11/780, VAX-11/785

MicroVAX: MicroVAX II, MicroVAX 2000,
MicroVAX 3100, MicroVAX 3300,
MicroVAX 3400, MicroVAX 3500,
MicroVAX 3600, MicroVAX 3800,
MicroVAX 3900

VAXstation: VAXstation II, VAXstation II/GPX,
VAXstation 2000, VAXstation 3100 Series,
VAXstation 3200, VAXstation 3500,
VAXstation 3520, VAXstation 3540

VAXserver: VAXserver 100, VAXserver 2000,
VAXserver 3100, VAXserver 3300,
VAXserver 3400, VAXserver 3500,
VAXserver 3600, VAXserver 3602,
VAXserver 3800, VAXserver 3900

VAXserver 6000-210, VAXserver 6000-220,
VAXserver 6000-310, VAXserver 6000-320,
VAXserver 6000-410, VAXserver 6000-420,
VAXserver 6000-510, VAXserver 6000-520

digital™

April 1991
AE-PBAHC-TK

RISC-Based Processors:

DECstation: DECstation 2100, DECstation 3100, DECstation 3100s, DECstation 5000 Model 200, DECstation 5000 Model 200CX, DECstation 5000 Model 200PX, DECstation 5000 Model 200PXG, DECstation 5000 Model 200PXG TURBO

DECsystem: DECsystem 3100, DECsystem 5000 Model 200, DECsystem 5100, DECsystem 5400, DECsystem 5500, DECsystem 5810, DECsystem 5820, DECsystem 5830, DECsystem 5840

For DOS Load Host Systems:

PC: VAXmate

DECstation 200, DECstation 210, DECstation 212, DECstation 220, DECstation 300, DECstation 316, DECstation 320, DECstation 325, DECstation 333, DECstation 350, DECstation 425

Olivetti® M24, Olivetti M28, Olivetti M240, Olivetti M250, Olivetti M280, Olivetti M290, Olivetti M300, Olivetti M380, Olivetti M486

Tandy 3000NL, Tandy 4025LX

IBM® 5150, IBM 5160, IBM 5162, IBM 5170, IBM 8530, IBM 8550, IBM 8555, IBM 8560, IBM 8570, IBM 8580

COMPAQ® Deskpro®, COMPAQ Deskpro 286, COMPAQ Deskpro 386, COMPAQ Deskpro 486

Toshiba® T3200, Toshiba T5200

Zenith Z-248, Zenith Z-386, Zenith 286

For DOS load host support, refer to the supported base systems chart in PATHWORKS for DOS (SPD 55.07.xx) for a list of supported systems configurations, and specific model numbers.

Processors Not Supported:

MicroVAX I, VAXstation I, VAX-11/725, VAX-11/782, VAXstation 8000

Load Host System Restrictions

Every load host on which the DECrouter 250 software is installed must contain:

- A valid system configuration for the relevant operating system and for the appropriate DECnet product (refer to the DECnet and appropriate operating system Software Product Descriptions)
- A supported connection to DECrouter 250 (DSRVR) or DEC WANserver 150 (DSRVJ) hardware unit
- An appropriate device available to read the software during installation:
  - — For VMS and MicroVMS Operating Systems: magnetic tape or TK50 drive
  - — For ULTRIX Operating Systems: magnetic tape or TK50 drive
  - — For MS-DOS® Operating Systems: an RX24 or RX31 drive (a minimum of two drives, at least one of which must be capable of reading 5.25 inch 360 Kbyte diskettes or 3.5 inch 720 Kbyte diskettes)

Other Hardware Required

The DECrouter 250 software runs only on the DECrouter 250 (DSRVR) or DEC WANserver 150 (DSRVJ) hardware available as follows:

- DSRVR-AA for use with 120V AC power supplies
- DSRVR-AB for use with 240V AC power supplies
- DSRVJ-AA for use with 120V AC power supplies
- DSRVJ-AB for use with 240V AC power supplies

The DSRVR and DSRVJ have a selectable ThinWire/Thickwire connector.

Both the DSRVR and DSRVJ require adapter cables to provide the necessary interchange circuits at the appropriate electrical interface types for their high speed ports. The DSRVJ has one high speed port, the DSRVR has two high speed ports. One of these cables is needed for each high speed port used. The following table shows the cable numbers for each of the electrical interface types:

Adapter Cables

Electrical Interface Type	Adapter Cable
V.11/EIA-422/V.36	BC19B-02
V.10/EIA-423	BC19E-02
V.35	BC19F-02
V.24/V.28	BS23V-02

Within the UK, an additional adapter cable is needed to allow connection to the British Telecom Kilostream as listed:

BC22X-02

Note: The DSRVR has six 25-pin V.24/V.28 (RS232-D) ports that do not need an adapter cable. The DSRVJ has one 25-pin V.24/V.28 (RS232-D) port that does not need an adapter cable.

Disk Space Requirements — VMS

Disk Space Requirements (Block Cluster Size = 1):

Disk space required for installation:	2,850 blocks (1,425 Kbytes)
Disk space required for use (permanent):	2,780 blocks (1,390 Kbytes)

Disk Space Requirements — ULTRIX

For VAX-Based and RISC-Based Systems:

Disk space required for installation:

Root file system:	/0 Kbytes
Other file systems:	/usr 1,020 Kbytes (VAX)
Other file systems:	/usr 1,110 Kbytes (RISC)
	/var 0 Kbytes

Disk space required for use (permanent):

Root file system:	/0 Kbytes
Other file systems:	/usr 1,010 Kbytes (VAX)
Other file systems:	/usr 1,100 Kbytes (RISC)
	/var 0 Kbytes

For DOS Systems:

Disk space required for installation:	1,235 Kbytes

These counts refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options.

OPTIONAL HARDWARE

Modems Supported

DEC DF03, DF112, and DF224

Hayes® SmartModem 2400™

CODEX 2233/2260

CLUSTER ENVIRONMENT (VMS only)

This layered product is fully supported when installed on any valid and licensed VAXcluster* configuration without restrictions. The *HARDWARE REQUIREMENTS* sections of this product's Software Product Description and System Support Addendum detail any specific hardware required by this product.

* V5.x VAXcluster configurations are fully described in the VAXcluster Software Product Description (29.78.xx) and include CI, Ethernet, and Mixed Interconnect configurations.

SOFTWARE REQUIREMENTS

For each VMS System acting as a load host or dump receiver:

VMS Operating System V5.0 - V5.4
DECnet-VAX V5.0 - V5.4 (either end-node or full-function)

For each VAX/ULTRIX System acting as a load host or dump receiver:

ULTRIX Operating System V4.0 - V4.1
DECnet-ULTRIX V4.0

For each RISC/ULTRIX system acting as a load host or dump receiver:

ULTRIX Operating System V4.0 - V4.1
DECnet-ULTRIX V4.0

For each DOS System acting as a load host or dump receiver:

One of the following Operating systems:

COMPAQ DOS V3.31, V4.0, V4.01
DECstation DOS V3.3, V4.0
IBM DOS V3.3, V4.0
Olivetti DOS V3.3, V4.0, V4.01
Tandy DOS V3.30, V4.01
Toshiba DOS V3.3 (R3C90US), V4.01 (R4A15US)
Zenith DOS V3.3+, V4.0, V4.01
DECnet PCSA Client for DOS V3.0
PATHWORKS for DOS, V4.0

VMS Tailoring (VMS only)

For VMS V5.x systems, the following VMS classes are required for full functionality of this layered product:

- VMS Required Saveset
- Network Support

For more information on VMS classes and tailoring, refer to the VMS Operating System Software Product Description (SPD 25.01.xx).

OPTIONAL SOFTWARE

None

GROWTH CONSIDERATIONS

The minimum hardware/software requirements for future versions of this product may differ from the requirements for the current version.

DISTRIBUTION MEDIA

For VAX or RISC systems, running VMS or ULTRIX, acting as a load host:

Tape: TK50 Streaming Tape, 9-track 1600 BPI Magtape

For VMS Load Host Systems:

This product is also available as part of the VMS Consolidated Software Distribution on CDROM.

For DOS systems, running MS-DOS, acting as a load host:

Disk: RX24 Floppy Diskette, RX31 Floppy Diskette

ORDERING INFORMATION

For VMS Operating Systems:

Software Licenses: QL-YG6A9-**
Software Media: QA-YG6AA-**
Software Documentation: QA-YG6AA-GZ
Software Product Services: QT-YG6*-**

For ULTRIX Operating Systems on VAX:

Software Licenses: QL-YG6A9-**
Software Media: QA-YG6AB-**
Software Documentation: QA-YG6AB-GZ
Software Product Services: QT-YG6*-**

For ULTRIX Operating Systems on RISC:

Software Licenses: QL-YG6A9-**
Software Media: QA-YG6AD-**
Software Documentation: QA-YG6AD-GZ
Software Product Services: QT-YG6*-**

For DOS Operating Systems:

Software Licenses: QL-YG6A9-**
Software Media: QA-YG6AC-**
Software Documentation: QA-YG6AC-GZ
Software Product Services: QT-YG6*-**

* Denotes variant fields. For additional information on available licenses, services, and media, refer to the appropriate price book.

The above information is valid at the time of release. Please contact your local Digital office for the most up-to-date information.

® Hayes is a registered trademark of Hayes Microcomputer Products, Inc.

® IBM is a registered trademark of International Business Machines Corporation.

® COMPAQ and Deskpro are registered trademarks of COMPAQ Computer Corporation.

® Olivetti is a registered trademark of Ing. C. Olivetti.

® Tandy is a registered trademark of Tandy Corporation.

® Toshiba is a registered trademark of Kabushiki Kaisha Toshiba.

® MS-DOS is a registered trademark of Microsoft Corporation.

™ SmartModem 2400 is a trademark of Hayes Microcomputer Products, Inc.

™ The DIGITAL Logo, CI, DEC, DECnet, DECrouter, DECstation, DECsystem, MicroVAX, MicroVMS, PATHWORKS, ThinWire, ULTRIX, VAX, VAXcluster, VAXft, VAXmate, VAXserver, VAXstation, and VMS are trademarks of Digital Equipment Corporation.